CLAIMS

1. A method for recovering a surfactant from a water-carbon dioxide system comprising at least one type of surfactant, water and carbon dioxide,

the method comprising the step of bringing the water-carbon dioxide system into contact with a dehydrating agent to remove water.

2. The method according to claim 1, wherein the water-carbon dioxide system is a micelle, emulsion or homogenous dispersion system prepared by adding at least one type of surfactant to a two-phase system of water and carbon dioxide.

3. The method according to claim 1 or 2, wherein the water-carbon dioxide system comprises a non-surfactant component which is removed by adsorption together with or separately from water.

4. The method according to any one of claims 1, 2 and 3, wherein the surfactant is a fluorine-based surfactant.

5. The method according to any one of claims 1, 2 and 3, wherein a fluorine-based surfactant and a non-fluorine-based surfactant are used as surfactants, and a mixture of these surfactants is recovered.

6. The method according to any one of claims 1 to 5, wherein a cosolvent (entrainer) is used.

7. The method according to any one of claims 1 to 6, wherein the carbon dioxide is either liquid, subcritical or supercritical.

8. A method for recovering and reusing a surfactant,

the method comprising the steps of, in an aqueous solution system of liquid, subcritical or supercritical carbon dioxide and an electrolyte, carrying out in the presence of at least one type of surfactant an electrochemical reaction, dehydrating the solution after the reaction, and recovering and reusing surfactant-containing carbon dioxide.

9. The method according to claim 8, wherein the electrochemical reaction is plating.

10. A method for recovering a surfactant,

the method comprising the steps of washing, drying, or dehydrating a precision machinery component or a semiconductor wafer using a water-carbon dioxide system comprising at least one type of surfactant, water, and liquid, subcritical or supercritical carbon dioxide, and bringing the water-carbon dioxide system into contact with a dehydrating agent.

11. A method comprising the steps of installing a device for selectively removing a removal target in a circulation line in which circulated is a mixed system comprising carbon dioxide, a carbon dioxide-compatible surfactant and/or a cosolvent, and a removal target; circulating the mixed system; and selectively removing the removal target that has been incorporated into the surfactant and/or cosolvent.

12. The method according to claim 11, wherein the removal target is water, an inorganic salt, a resist residue or a contaminant.

13. The method according to claim 11 or 12, wherein the carbon dioxide is either supercritical, subcritical or liquid.

14. The method according to any one of claims 11 to 13, wherein the removal target is water and the removal device is filled with a dehydrating agent.

15. An apparatus for removing a removal target from a high-pressure fluid comprising carbon dioxide and a surfactant,

the apparatus being equipped with a high-pressure device into which carbon dioxide, a surfactant, and a removal target or an item comprising the removal target are introduced; a circulating pump for circulating in a circulation line a high-pressure fluid comprising carbon dioxide, a surfactant and the removal target; and a removal device in the high-pressure line for removing the removal target,

the apparatus being designed to selectively remove at the removal device a carbon dioxide-insoluble removal target incorporated into the high-pressure fluid in the form of a micelle, emulsion or homogenous dispersion system by means of the

surfactant.